

CLAIMS

1. A press forming method comprising the steps of:
providing a press machine comprising
 - a fixed plate,
 - a slide plate disposed to face the fixed plate and movable relatively to the fixed plate and
 - a plurality of drive sources each having a servo-motor for driving the slide plate and pressing each of a plurality of engaging portions positioned on the slide plate to press horizontally the slide plate,measuring a load working on each of the plurality of drive sources at each of descending displacements of the slide plate, while the slide plate is displaced to press-form a work-piece,
applying the load at each of the descending displacements and a target speed for production forming for one (hereinafter referred to as "reference drive source") of the plurality of drive sources at each of the descending displacements to a function that shows a delay of a drive source from an instructed displacement in terms of a speed of the drive source and a load working on the drive source, thereby calculating a speed (hereinafter referred to as "compensation speed") for each of the plurality of drive sources to eliminate a delay for each of the plurality of drive sources from the reference drive source,
driving each of the plurality of drive sources at the compensation speed to press-form a work-piece in a trial forming,
measuring a delay of each of the plurality of drive sources during the trial forming,
until delays of other drive sources from the reference drive source become not more than a predetermined value, repeating correction of the compensation speed, the trial forming and the measurement of the delay during the trial forming, and
when the delays of the other drive sources from the reference drive source become not more than the predetermined value, press-forming work-pieces at corrected respective speeds of the plurality of drive sources in a production forming.
2. A press forming method as set forth in claim 1, wherein the reference drive source

is among the plurality of drive sources a drive source on which the smallest load works at each of the descending displacements.

3. A press forming method as set forth in claim 1, wherein the compensation speed (V_n) for a drive source (n) is expressed as $V_f + \Delta V_n$, in which V_f is a target speed for the reference drive source and ΔV_n is a speed increment for the reference drive source from the target speed (V_f) for the compensation speed (V_n) calculated by using a function that shows a delay of a drive source in terms of a speed of the drive source (n) and a load working on the drive source (n), and the trial forming is performed by driving each of the plurality of drive sources at a speed of $V_f + 50$ to 90 % of the speed increment calculated above.

4. A press forming method as set forth in claim 2, wherein the compensation speed (V_n) for a drive source (n) is expressed as $V_f + \Delta V_n$, in which V_f is a target speed for the reference drive source and ΔV_n is a speed increment for the reference drive source from the target speed (V_f) for the compensation speed (V_n) calculated by using a function that shows a delay of a drive source in terms of a speed of the drive source (n) and a load working on the drive source (n), and the trial forming is performed by driving each of the plurality of drive sources at a speed of $V_f + 50$ to 90 % of the speed increment calculated above.